

PATENT APPLICATION
DOCKET NO. L7039-0001

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently amended): A diagnostic apparatus for examining a heating, ventilation, and air conditioning (HVAC) system having an internal controller sending control signals to an electronically-driven motor of the HVAC system, said apparatus comprising:

a control unit detachably connected to the HVAC system, said control unit controlling a plurality of control parameters associated with the electronically-driven motor of the HVAC system; and

means for said control unit to monitor a plurality of performance characteristics associated with the electronically-driven motor of the HVAC system;

means for said control unit to monitor the control signals of the HVAC System's internal controller;

whereby said control unit monitors the plurality of performance characteristics while controlling the HVAC system to provide a diagnostic check of the HVAC system.

Claim 2 (Currently amended): The diagnostic apparatus of claim 1 wherein said control unit controls a plurality of control parameters through a plurality of control function activators providing control functions to the electronically-driven motor of the HVAC system.

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Claim 3 (Original): The diagnostic apparatus of claim 2 wherein said control function activators provide control functions directly to the HVAC system.

Claim 4 (Currently amended): The diagnostic apparatus of claim 1 wherein said control unit controls a plurality of control parameters as a control system separate from internal controls of the HVAC system, wherein said control unit controls the plurality of control parameters upon activation of a single switch, thereby isolating the HVAC System's internal controls from the electronically-driven motor.

Claim 5 (Canceled)

Claim 6 (Original): The diagnostic apparatus of claim 1 wherein said control unit includes a visual indication of at least one properly functioning control circuit associated with at least one of the plurality of control parameters of the HVAC system.

Claim 7 (Original): The diagnostic apparatus of claim 1 wherein said control unit includes means for variably adjusting and thereby controlling at least one control parameter of the HVAC system over a continuous range of operation.

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Claim 8 (Currently amended): The diagnostic apparatus of claim 7 wherein said variable control means is a pulse width adjuster to test and verify operation of control parameters that respond to a duty cycle.

Claim 9 (Original): The diagnostic apparatus of claim 7 wherein said variable control means is a variable voltage threshold (V_{th}) function adjuster.

Claim 10 (Original): The diagnostic apparatus of claim 1 wherein said means for said control unit to monitor a plurality of performance characteristics of the HVAC system includes a display providing a graphical representation of at least one performance characteristic.

Claim 11 (Original): The diagnostic apparatus of claim 1 wherein said control unit is powered from a power source separate from any power source powering the HVAC system.

Claim 12 (Original): The diagnostic apparatus of claim 1 wherein said control unit is powered by the same power source powering the HVAC system.

Claim 13 (Currently amended): The diagnostic apparatus of claim 1 wherein said control unit connected to the HVAC system with a first cable extending from said control unit to a control system of the HVAC system and a second cable connecting said control unit to a the electronically-driven motor driving the HVAC system.

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Claim 14 (Original): The diagnostic apparatus of claim 1 wherein said monitoring means of a plurality of performance characteristics includes monitoring a voltage associated with the HVAC system.

Claim 15 (Currently Amended): The diagnostic apparatus of claim 1 wherein said monitoring means of a plurality of performance characteristics includes monitoring a revolution per minute count of a the electronically-driven-motor operating the HVAC system, wherein the performance characteristics include the current operating speed of the electronically-driven motor.

Claim 16 (Currently amended): The diagnostic apparatus of claim 1 wherein said monitoring means of a plurality of performance characteristics includes monitoring a Y and G threshold voltage voltages, the Y and G threshold voltages providing activation threshold voltages for operating a motor associated with the HVAC system.

Claim 17 (Currently amended): The diagnostic apparatus of claim 1 wherein said control unit includes a PWM duty cycle generator to test and verify operation of motors or other control actuators that respond to a duty cycle.

Claim 18 (Currently amended): An apparatus for examining a heating, ventilation, and air conditioning (HVAC) system having an internal controller sending control signals to an electronically-driven motor of the HVAC system, said apparatus comprising:

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a portable control unit detachably coupled to the HVAC system, said control unit monitoring a plurality of performance characteristics associated with a plurality of control parameters controlling the electronically-driven motor of the HVAC system and monitoring the control signals of the internal controller; and

means for controlling the electronically-driven motor of the HVAC system within the portable control unit through the plurality of control parameters of the HVAC system;

whereby said control unit monitors the plurality of performance characteristics while controlling the electronically-driven motor of the HVAC system to determine a status of the HVAC system.

Claim 19 (Original): The diagnostic apparatus of claim 1 wherein:

the HVAC system includes a control system controlling a motor within the HVAC system;
and

said control unit includes a selectable switch, said switch allowing said control unit to operate in a first mode to monitor a plurality of interconnected functions between the HVAC system and the motor and a second mode to disconnect the control system from operating and controlling the motor;

whereby switching between the first mode and the second mode provides means for isolating a location of a malfunction occurring within the HVAC system.

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Claim 20 (Currently amended): A diagnostic apparatus for examination of a heating, ventilation, and air conditioning (HVAC) system having an internal controller sending control signals to an electronically-driven motor of the HVAC system, said apparatus comprising:

a control unit having connecting means to the HVAC system, said control unit controlling a plurality of control parameters of the electronically-driven motor of the HVAC system through a plurality of control function activators providing control functions to the HVAC system, said control unit variably controlling at least one control parameter; and

means for said control unit to monitor a plurality of performance characteristics of the electronically-driven motor of the HVAC system;

means for said control unit to monitor the control signals of the internal controller;

whereby said control unit monitors the plurality of performance characteristics while controlling the HVAC system to provide a diagnostic check of the HVAC system.